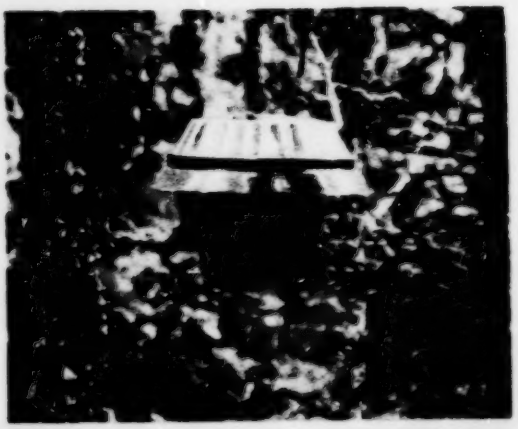
Environment Canada | Environnement Canada
Canadian Forestry Service | Service canadien des forêts
Environment Canada | Environnement Canada

0016084C VOL ISS 223 1984
EXC # 001
SD 391 C363
INFORMATION REPORT N-X - NEWFOUND
LAND FOREST RESEARCH CENTRE.
OOFF

Forest insect and disease conditions in Newfoundland and Labrador in 1983

L. J. Clarke and G. C. Carew

Information Report N-X-223
Newfoundland Forest Research Centre



NEWFOUNDLAND FOREST RESEARCH CENTRE

The Newfoundland Forest Research Centre (NeFRC) is an establishment of the Canadian Forestry Service, Environment Canada. The Research Centre conducts most of the forestry research in the Newfoundland Region and is one of six similar regional establishments in Canada.

The objective of NeFRC is to provide the scientific, technological and economic information and services required for the improvement, protection, and efficient utilization of the forest resources of the Province of Newfoundland and Labrador. Its work is directed towards satisfying the requirements of the Provincial Government, the forest industry, federal agencies having forestry related programs and other clients of the Canadian Forestry Service; many of its studies are undertaken jointly with client agencies. The research Centre attempts to bring the results of research to potential users by publishing information reports, articles in scientific journals, and by demonstrations of research results. It seeks to keep the public informed of its work by means of special displays, seminars, and related activities.

The NeFRC program has three principal components - Forest Resources and Environmental Research, Forest Protection Research, and Forestry Development.

Cover Photographs

Top Left	Foureyed Spruce Bark Beetle, Polygraphus rufipennis (Kirby) Shown magnified 35 X
Bottom Left	Egg and larval galleries of the Foureyed Spruce Bark Beetle.
Top Right	Spruce Budworm pheromone trap.
Bottom Right	Examining hydraulically exposed roots for Armillaria Root Rot in a black spruce stand.

FOREST INSECT AND DISEASE CONDITIONS IN NEWFOUNDLAND AND LABRADOR IN 1983

by L.J. Clarke and G.C. Carew

INFORMATION REPORT N-X-223
1984

NEWFOUNDLAND FOREST RESEARCH CENTRE
CANADIAN FORESTRY SERVICE
ENVIRONMENT CANADA

©Minister of Supply and Services Canada 1984

ISSN No. 0704-7657
CAT. No. F046-15/223E
ISBN No. 0-662-13334-X

Copies of this report are available from:

Newfoundland Forest Research Centre
Canadian Forestry Service
P.O. Box 6028, St. John's
Newfoundland, Canada A1C 5X8

Telephone No. 709-772-4817

ABSTRACT

This report summarizes forest pest conditions in Newfoundland and Labrador in 1983 and was compiled from information collected in 12 Forest Insect and Disease Survey Districts. Major pests of fir, spruce, pine and larch forests and deciduous tree species are discussed in detail and pests of lesser importance are tabulated.

RÉSUMÉ

Ce rapport est un résumé de la situation des ravageurs forestiers à Terre-Neuve et au Labrador en 1983. Les renseignements qu'il contient proviennent du relevé des insectes et des maladies des arbres effectué dans 12 districts. Les ravageurs des forêts de sapin, d'épinette, de pin et de mélèze et ceux des espèces feuillues font l'objet d'un exposé détaillé et les ravageurs de moindre importance sont présentés sous forme de tableau.

TABLE OF CONTENTS

	Page
ABSTRACT/RÉSUMÉ	i
ACKNOWLEDGEMENTS	iii
INTRODUCTION	1
SUMMARY	1
SPRUCE AND FIR PESTS	5
Spruce Budworm	5
The Four-Eyed Spruce Bark Beetle in Black Spruce	14
Armillaria Root Rot	15
Eastern Hemlock Looper	18
Balsam Woolly Aphid	19
Spruce Beetle	19
Black Army Cutworm	20
Spruce Bud Midge	20
Spruce Cone Rust	21
Spruce Budmoth	21
Eastern Blackheaded Budworm	21
Yellowheaded Spruce Sawfly	22
Needle Rust of Conifers	22
Tip Blight of Balsam Fir	22
Winter Drying	23
Frost Damage	23
PINE AND LARCH PESTS	23
Scleroderris Canker	23
Eastern Larch Beetle	24
Larch Sawfly	24
Larch Shoot Moth	25
White Pine Blister Rust	25
Pine Root Collar Weevil	25
DECIDUOUS TREE PESTS	26
Birch Casebearer	26
Shoot and Leaf Blight of Aspen	26
Leaf Rust of Aspen	26
Gypsy Moth and Forest Tent Caterpillar	27
OTHER INSECTS AND DISEASES	28

ACKNOWLEDGEMENTS

Information for this report is based on the results of surveys conducted by all personnel of the Forest Insect and Disease Survey and research officers of the Forest Protection Section. The cooperation of the Provincial Department of Forest Resources and Lands, providing technicians, casual workers, inventory maps and aircraft time for insect and disease assessment and the forest industry for providing inventory figures was greatly appreciated.

INTRODUCTION

This report summarizes forest insect and disease conditions in the forests of Newfoundland and Labrador for 1983 and provides a forecast of conditions for 1984. The region is divided into 12 ranger districts with four district rangers responsible for detecting, monitoring and collecting forest pests, maintaining records and surveys to support forest research and providing advisory services on forest insect and disease conditions to governments, industry and the general public. The information in this report was compiled from the observations and field records of the district rangers and other survey personnel. The Forest Insect and Disease Survey Districts and the Provincial Forest Managements Units are included for reference (Figs. 1 and 2). A more detailed report is on file at the Newfoundland Forest Research Centre.

SUMMARY

The most destructive insects in the Province in 1983 were the spruce budworm, hemlock looper, four-eyed spruce bark beetle, black army cutworm, spruce beetle and larch beetle. The balsam woolly aphid, blackheaded budworm, spruce budmoth, pine root collar weevil, yellow-headed spruce sawfly and spruce bud midge increased in localized areas throughout the Province and caused some tree damage. The larch sawfly outbreak decreased drastically in 1983 to only a few patches of infestation. The larch shoot moth was collected on the Island for the first time since 1958. The birch casebearer caused the most damage to hardwoods as population levels increased in central Newfoundland.

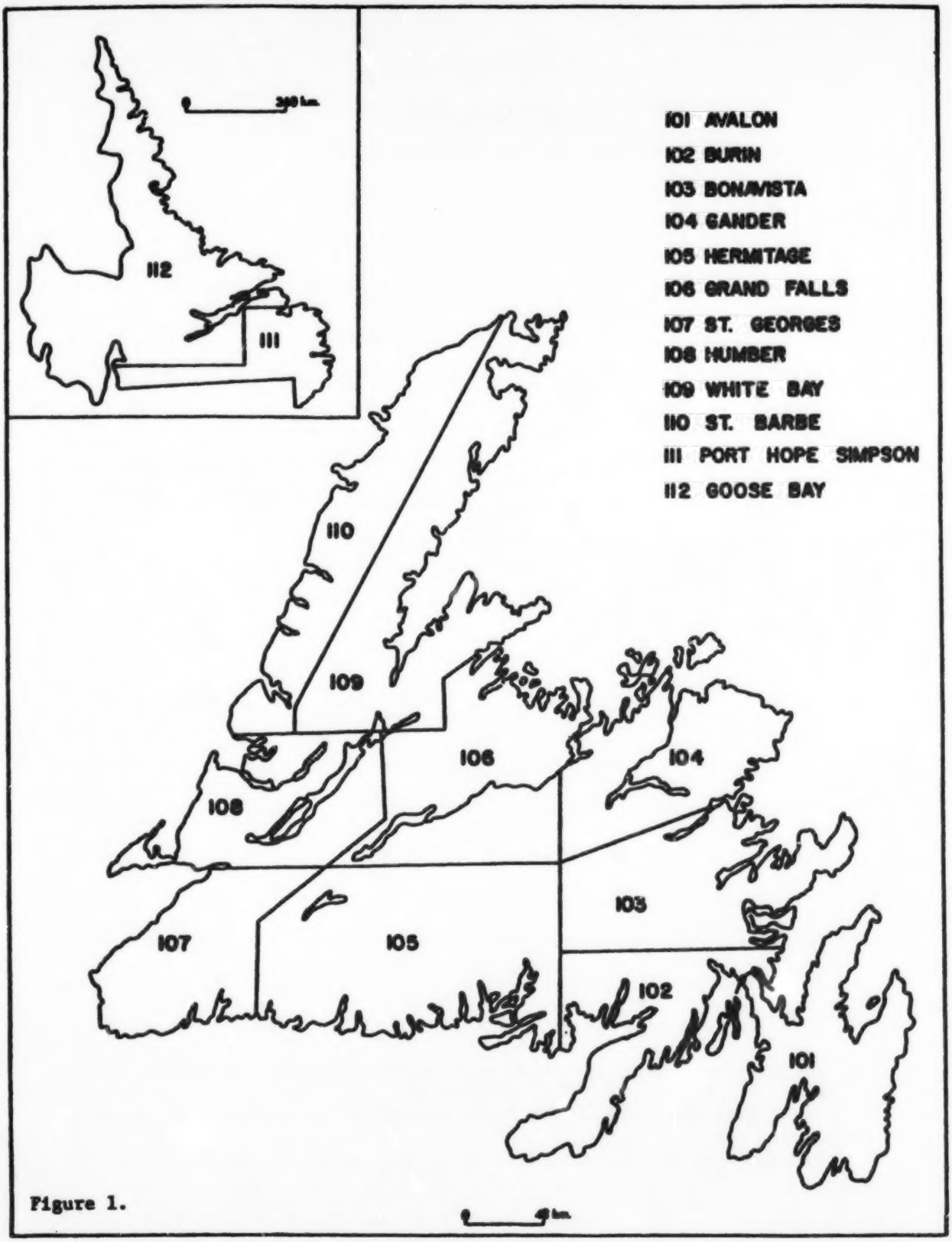


Figure 1.

Forest Insect and Disease Survey Districts.

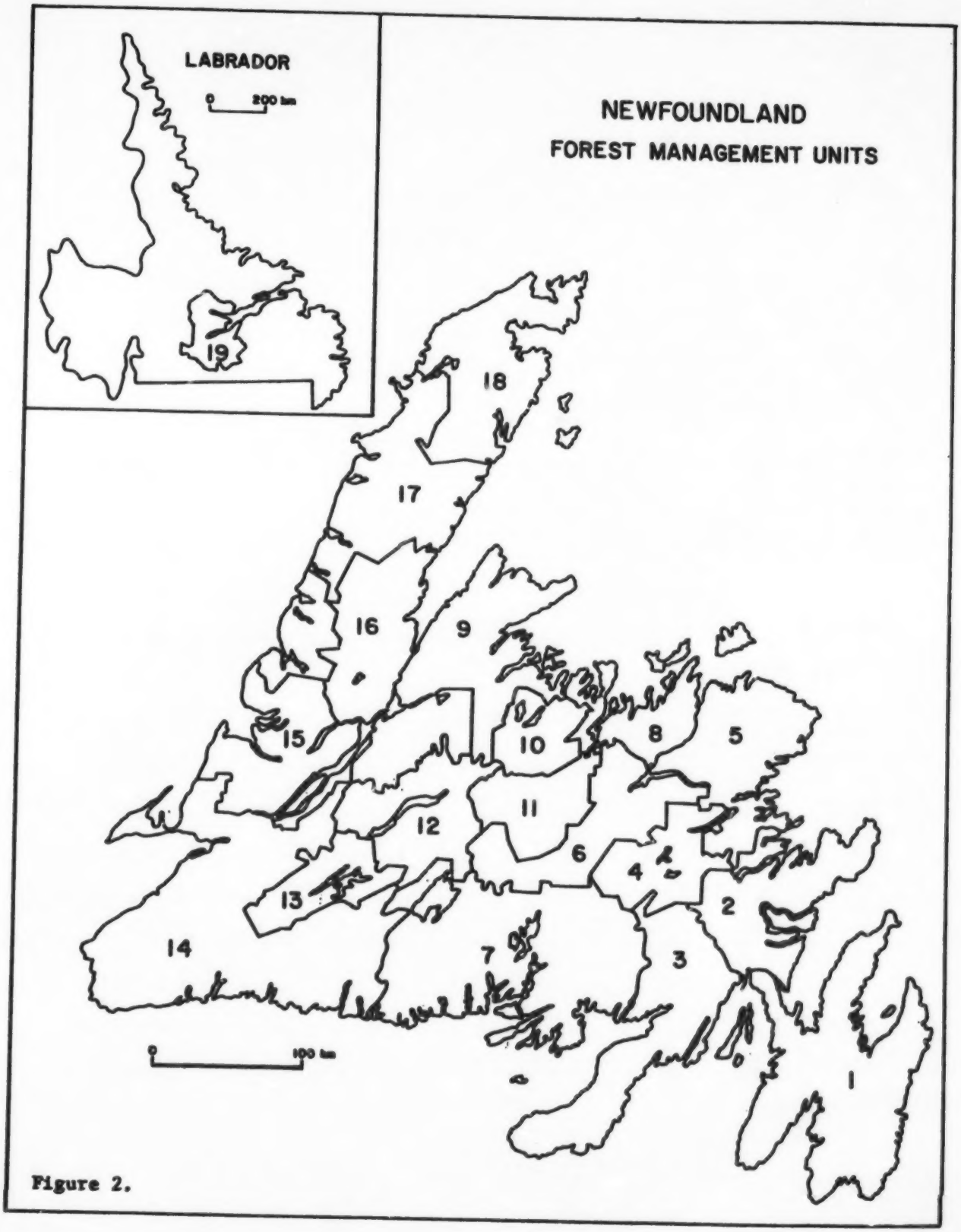

LABRADOR
0 200 km
19
NEWFOUNDLAND
FOREST MANAGEMENT UNITS
18
17
16
9
15
10
8
5
11
12
6
4
2
13
14
7
3
1
0 100 km

Figure 2.

Armillaria root rot was the most important tree disease and caused severe damage contributing to tree mortality in black spruce stands in central and eastern Newfoundland. Scleroderris canker continued to spread to ornamental pine trees throughout the city of St. John's. A high incidence of white pine blister rust infection occurred at Indian River Provincial Park. Needle rusts of black spruce and balsam fir were common in western Newfoundland. Shoot and leaf blight of trembling aspen was common throughout central Newfoundland and in a few locations in Labrador. Leaf rust of aspen was observed on 100% of the saplings in the Canadian Forestry Service Nursery at Pasadena. Winter drying of softwood foliage occurred throughout the west side of the Northern Peninsula. Frost damage causing varying degrees of damage was recorded throughout central Newfoundland. Inland spruce cone rust and tip blight of balsam fir caused some damage but only of a minor degree.

Aerial surveys were conducted in fixed-wing aircraft and helicopters in the productive forests of the Island and Labrador. Approximately 59 hours were flown in the aerial survey and 115 hours in helicopters in cooperation with the Inventory Section of the Department of Forest Resources and Lands in the damage assessment survey.

A biological survey of forest insects in northern Labrador was conducted this summer using light traps and sweep nets to collect specimens. Native high-school students were selected from Makkovik

Hopedale and Nain and trained in insect mounting techniques. Similar surveys were conducted at Goose Bay in 1980 and 1981. These projects were funded as a Summer Youth Employment Program by the Canada Employment and Immigration Commission.

SPRUCE AND FIR PESTS

Spruce budworm, Choristoneura fumiferana (Clem.) - Larval sampling and egg mass surveys in 1982 indicated that moderate and severe defoliation would occur in 110 000 ha distributed from South Branch to the Humber Canal near Deer Lake in western Newfoundland and along a section of the Noel Paul's Brook in central Newfoundland. In Labrador the infestation was expected to be about 1000 ha along Beaver River.

In 1983 warm and dry weather conditions prevailed throughout the Island from April to mid-July pushing insect and tree development about three weeks ahead of last year. Larval development progressed rapidly, defoliation was complete by July 15, and local moths were trapped as early as July 4. However, between mid-July to late August, heavy rains occurred and may have affected some of the budworm moth flights. The weather for the remainder of the season was above normal, dry and warm. In Labrador, weather conditions were near normal during the summer except for heavy rainfall in mid-July.

Ground and aerial surveys showed that although budworm defoliation was more widely distributed in 1982, it had only increased

from 90 000 ha in 1982 to 100 000 ha in 1983 (Table 1, Fig. 3). The increase in distribution of larvae occurred along the north side of Bay of Islands, the Northern and Baie Verte Peninsulas, the Noel Paul's Brook area and the Bonavista Peninsula.

A decrease in defoliation was recorded in the Stephenville - Port au Port area, and near Glide Lake (Fig. 3). However, the area of moderate and severe defoliation increased significantly from 42 000 ha in 1982 to 68 000 ha in 1983. In Labrador, the two small infestations near Goose Point and Beaver River decreased from a total of 700 ha in 1982 to 360 ha in 1983.

Table 1. Area (ha) of defoliation caused by the spruce budworm in productive forests of Newfoundland in 1983.

Management Unit No.	Defoliation Class[1]			
	Light	Moderate	Severe	Total
2	272	-	-	272
9	2 569	-	2 171	4 740
10	286	-	-	286
11	-	-	194	194
12	1 679	-	4 236	5 915
14	11 706	2 660	34 090	48 456
15	15 486	1 435	22 419	39 340
16	2 151	-	194	2 345
17	224	-	-	224
18	1 334	-	-	1 334
	35 707	4 095	63 304	103 106
Labrador	68	-	297	365

[1]Light: 1-25%
Moderate: 26-75%
Severe: 76-100%

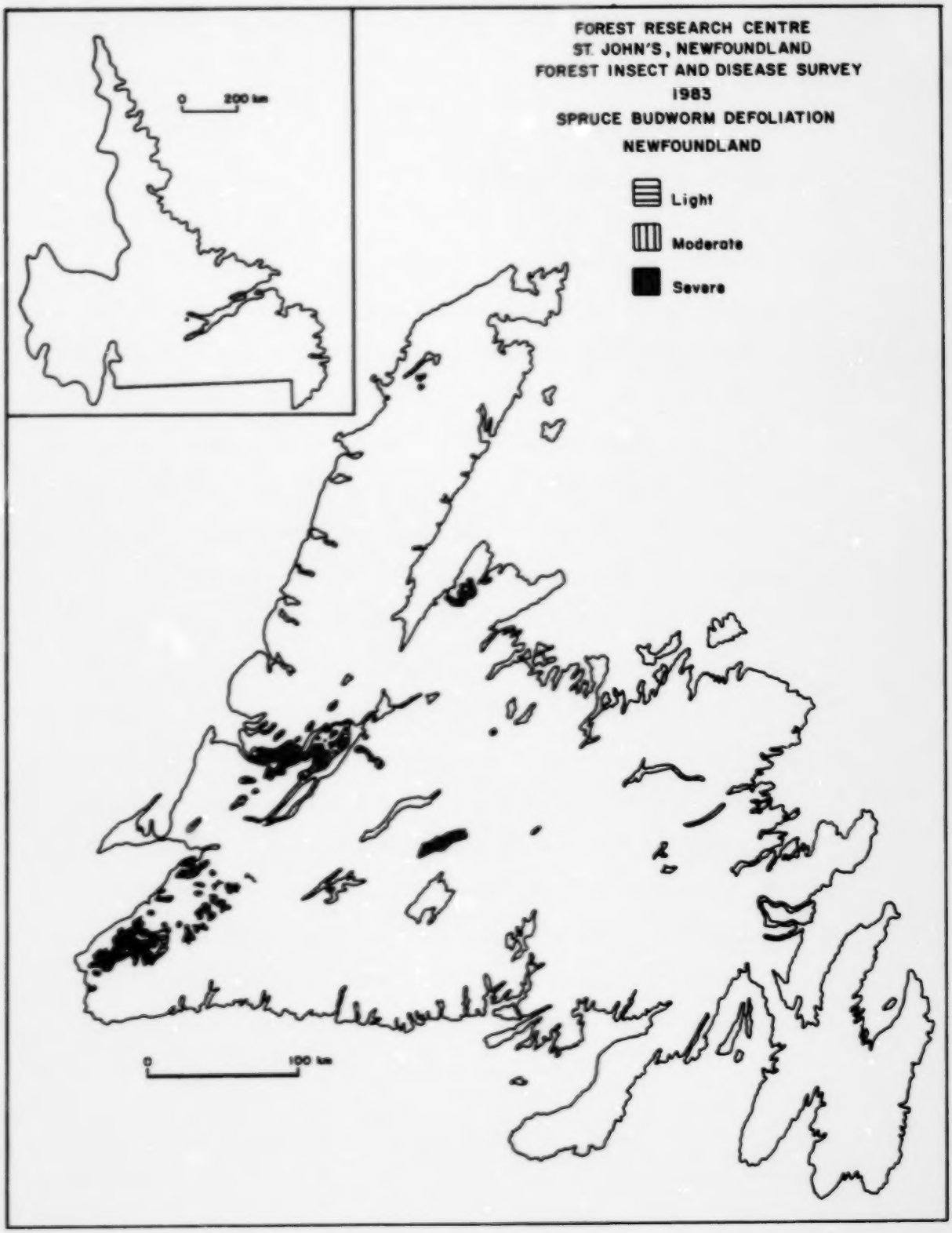


Figure 3. Areas of light, moderate and severe defoliation by the spruce budworm in Newfoundland in 1983.

Biological Control Factors

Weekly samples of spruce budworm were collected fom eight permanent sampling areas. The major larval parasites were Apanteles fumiferanae (Vier.) and Glypta fumiferanae (Vier.). The only pupal parasite reared and rcovered was a tachinid species. About 10% of spruce budworm reared were parasitized.

Fungal diseases caused less than 1% mortality of the reared budworm samples. The major fungal pathogen was Zoophthora radicans (Brefald). Incidence of microsporidian disease, caused by Nosema fumiferanae (Thom.), was about 3%.

Damage Assessment

Ground and aerial surveys were conducted jointly with the Inventory Section of the Provincial Department of Forest Resources and Lands to determine the area of tree mortality in the productive forests. The surveys included all productive areas but sampling was concentrated in the predominantly black spruce stands of central Newfoundland where general deterioration and much increased tree mortality occurred in 1982. The methods were similar to those initiated in 1982 with the goal of producing maps in 1:30,000, 1:50,000 and 1:250,000 scale to show tree mortality separately for balsam fir and black spruce stands in five damage classes (1-10%, 11-25%; 26-50%; 51-75% and 76-100%).

The comprehensive analysis of the 1983 damage assessment has not been completed but preliminary results indicate that the area of merchantable balsam fir stands did not increase appreciably from 1982 (Fig. 4). However, the proportion of tree mortality in predominantly fir stands increased from 19 074 000 m^3 to 19 905 000 m^3 and the proportion of dying trees from 1 119 000 m^3 to 1 984 000 m^3. The total volume of these stands was estimated at 40 441 000 m^3.

The general deterioration and increased tree mortality that Newfoundland continued in 1983 (Fig. 5). The most noticeable increase occurred in the Halls Bay and Twin Lakes region where isolated areas of mortality coalesced. The areas of tree mortality also increased and coalesced in the Northwest Gander River Valley. The area of black spruce stands with more than 10% dead and dying trees increased from 80 500 ha in 1982 to about 95 700 ha in 1983. The volume of dead trees increased from about 2 000 000 m^3 to 3 194 000 m^3 and the volume of dying trees from 464 000 m^3 to about 915 000 m^3. The total volume of these stands was estimated at 8 200 000 m^3 in 1982 and about 10 322 000 m^3 in 1983. In addition dead and dying trees comprising less than 10% of the stand volume was recorded on 100 000 ha in 1983 (Fig. 4). Assuming an average volume of 100 m^3/ha the total volume of these stands is estimated at 10 000 000 m^3.

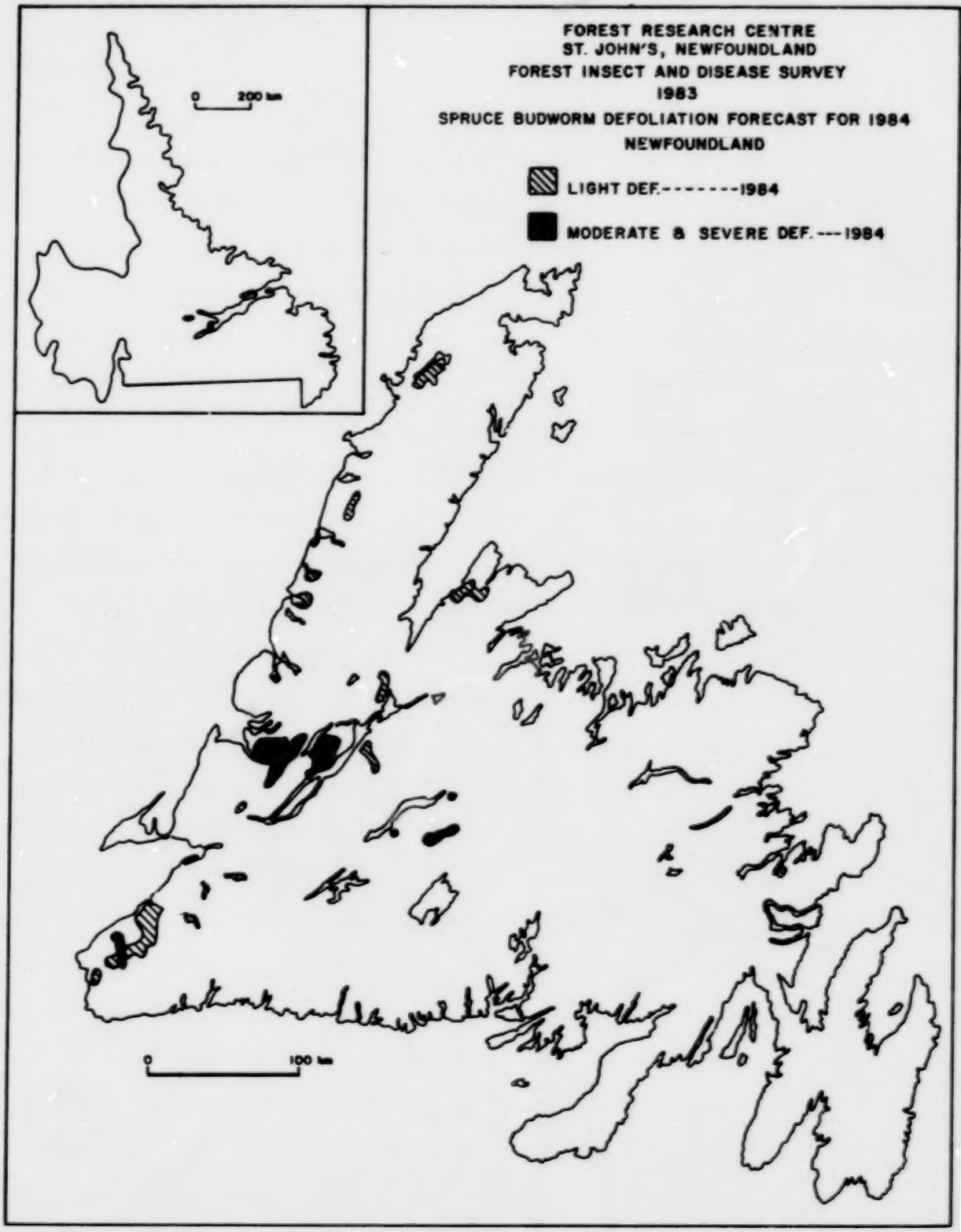


Figure 4. Areas of light, moderate and severe defoliation by the spruce budworm forecast in Newfoundland for 1984.

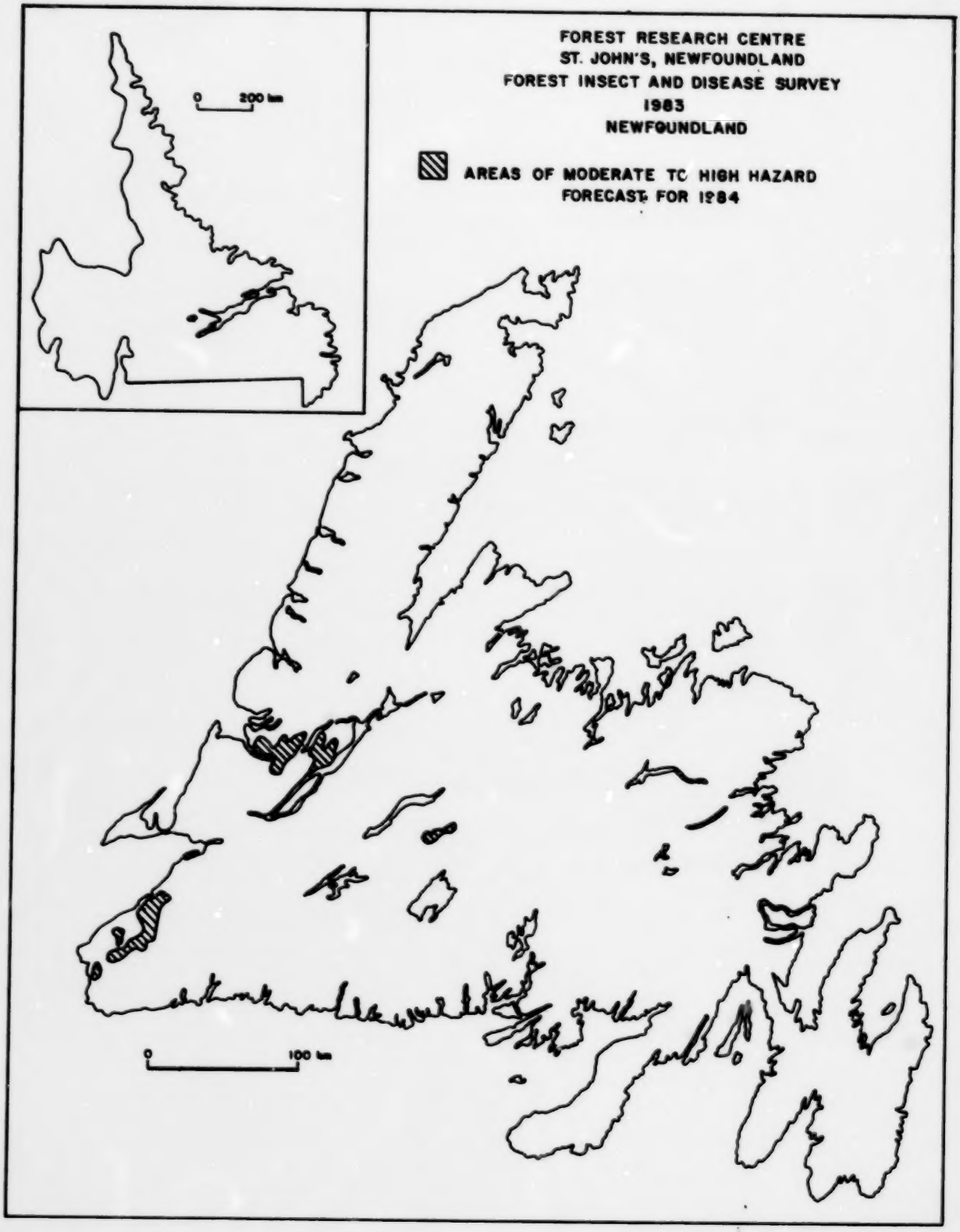


Figure 5. Areas of moderate and high spruce budworm hazard forecast in Newfoundland for 1984.

In summary the combined volume of balsam fir stands and black spruce stands with more than 10% mortality increased from 48 674 000 m^3 in 1982 to 50 763 000 m^3 in 1983. The volume of dead and dying trees at 25 978 000 m^3 comprise more than 50% of the volume of these stands.

Causal Factors of Black Spruce Mortality

All black spruce stands with tree mortality in central Newfoundland had been severely defoliated by the spruce budworm for several years prior to 1980 which resulted in some tree mortality and widespread top kill. However, following the decline of budworm populations most of the stands showed good recovery for two to three years until 1982 when the general stand deterioration commenced. In addition to the analysis of the history of budworm damage, work was initiated in 1983 to investigate the role of other factors in black spruce mortality. This work included: 1) establishment of new permanent plots, 2) comprehensive soil and site description with biological, physical and chemical analysis, 3) tree growth data from branch samples and stem analysis, 4) chemical analyses of foliage and ground vegetation for possible role of acid rain, 5) investigations of bark beetles, and 6) sampling for rootlet mortality and Armillaia root rot.

The Four-Eyed Spruce Bark Beetle in Black Spruce - Studies of the biology of the four-eyed spruce beetle, Polygraphus rufipennis (Kby.) showed one generation and three broods per year. Most new attacks in June were confined to trees with green foliage.

The beetle was active in all permanent plots established to monitor spruce mortality and stand conditions. Most trees dead by 1982 had evidence of previous beetle attack and practically all trees that died in 1983 had been invaded by this bark beetle.

Bark beetles successfully attacked and killed trees with all degrees of foliage loss. However, nearly half of the 204 trees attacked in 1983 and subsequently died had been classed as 100% defoliated (usually live) in October of 1982. Another 70 trees had been 80% or more defoliated. The remainder of the defoliation classes were about equally attacked except for the 40% and 50% defoliation classes. One obvious pattern in the data is that the lower defoliation classes were more frequently attacked in stands classed as "severely damaged". This could be caused by either higher beetle populations present in these stands, or by the increased susceptibility of trees in stands having had received more budworm damage in the late 1970's.

In summary, mortality of spruce continued in the plots in 1983: an additional 10% of the trees died in moderate and severe stands and about 5% in light and young stands. About 60% of the trees that died in 1983 had green foliage at the beginning of 1983 and about

25% had more than half of their foliage component. The degree of shoot elongation per year for the years 1975 to 1983 did not indicate a gradual decline of vigor in the stands sampled. Therefore, the beetle is able to kill trees that appear capable of complete recovery from spruce budworm damage - as judged by foliage conditions.

Armillaria Root Rot, Armillaria mellea (vahl ex Fr.) Kummer - In 1983 tree mortality continued in most of the major black spruce stands of central and eastern Newfoundland. Several factors appear to be contributing to this mortality including Armillaria root rot. A special survey was conducted in the light, moderate and severe budworm damaged classes to determine the status of the root rot in these stands. The roots of 192 trees were exposed hydraulically and examined for Armillaria root rot. Infection by Armillaria was 6% for light, 30% for moderate, and 55% for severe budworm damage. These data indicate that the root rot contributes significantly to the decline and mortality of black spruce previously damaged by the spruce budworm.

The occurrence of the root collar weevil, Hylobius warreni, wood damage in these stands also had a tendency to increase with defoliation. However, observations on the severity of damage indicated that this weevil did not contribute significantly to black spruce mortality.

Forecast for 1984

In addition to egg mass samples spruce budworm pheromone traps were placed in western and central Newfoundland. These traps caught numerous moths in areas of defoliation. However, traps away from defoliated areas, especially in central Newfoundland, caught only one to two moths, indicating low population levels.

The egg mass survey was conducted in over 600 sample points across the Island and 15 points in Labador. The area of light, moderate and severe defoliation for the Province in 1984 is forecast to be about 136 000 ha (Table 2). Moderate and severe defoliation on the Island is expected to be about 55 000 ha distributed along the North Branch of the Codroy River, near Corner Brook, Hughes Brook, Pasadena - Grand Lake and Noel Paul's Brook. Light defoliation is forecast to occur on 81 000 ha on the Island near Mummichog Provincial Park, throughout the Codroy Valley to Robinson's River, near Glenburnie, St. Pauls Inlet, Parsons Pond, Sandy Lake to Birchy Basin, Middle Arm to Wild Cove, Harbour Round Pond (Red Indian Lake) and Exploits River near the mouth of Noel Paul's Brook.

In Labrador total area of defoliation is forecast to be about 1500 ha (Table 2). Moderate and severe defoliation is expected to occur in 1000 ha along the Beaver River and about 500 ha of light defoliation near Goose Point.

Table 2. Areas (ha) of light, moderate and severe defoliation and areas of moderate and high hazard forecast in productive forests by the spruce budworm for Newfoundland in 1984.*

Management unit no	Ownership	Defoliation Category[1] Light	Moderate and severe	Totals	Moderate to high hazard
2	Crown	832	-	832	-
9	Bowater	11 727	-	11 727	-
12	Abitibi-Price	3 027	10 966	13 993	10 966
14	Crown	10 725	-	10 725	7 392
14	Bowater	17 643	1 799	19 442	18 644
15	Crown	-	12 855	12 855	12 855
15	Bowater	4 555	29 479	34 034	29 479
16	Bowater	8 441	-	8 441	-
17	Crown	2 127	-	2 127	-
17	Bowater	17 998	-	17 998	-
	GMNP	3 456	-	3 456	-
	Crown	13 684	12 855	26 539	20 247
ALL	Bowater	60 364	31 278	91 642	48 123
	Abitibi-Price	3 027	10 966	13 993	10 966
	GMNP	3 456	-	3 456	-
Total Island		80 531	55 099	135 630	79 336
Total Labrador		473	1 061	1 534	1 534
Total Province		81 004	56 160	137 164	80 870

*Forecast based on egg mass and overwintering larvae surveys.

[1]Light 1-25%
Moderate 26-75%
Severe 76-100%

Moderate to high hazard, based on tree condition and expected defoliation, is forecast to be about 80 000 ha for the Island and 1500 for Labrador (Table 2).

Population levels indicated by the number of egg masses per 10 m^2 of foliage are expected to be about 117 in the moderate defoliation category and 301 in the severe (Table 3).

Table 3. Summary of spruce budworm eggmass numbers per 10 m^2 of foliage for sample points with moderate and severe defoliation forecast in Newfoundland from 1978 to 1983.

	Moderage Defoliation Forecast*		Severe Defoliation Forecast*	
Year	Number sample points	Average EM/10 m^2	Number sample points	Average EM/10 m^2
1983	4	117	4	301
1982	10	147	7	379
1981	4	129	4	440
1980	49	149	123	437
1979	65	149	149	438
1978	72	154	124	491

*Class limits for defoliation forecast based on eggmasses per 10 m^2 of foliage:

Defoliation forecast	
Nil	0%
Light	1% - 25%
Moderate	26% - 75%
Severe	76% - 100%

Eastern Hemlock Looper, Lambdina fiscellaria fiscellaria (Guen.) - Infestations of this looper were recorded on the Avalon Peninsula and Bay d'Espoir areas. Severe defoliation occurred in about 550 ha along

Rocky River near Markland and light defoliation was patchy in an area of 8 900 ha from Markland to Harricot. Light defoliation occurred in an area of about 200 ha along the highway between St. Joseph's and Swanger Cover in the Bay d'Espoir area. It is expected that these infestations will continue in 1984 and could possibly increase in severity. In the regular larval survey this summer, looper larvae were also common throughout the Codroy Valley, along the North Shore of Bay of Islands in western Newfoundland and near Aspen Brook, Noel Paul's Brook and Lake Douglas in central Newfoundland indicating a general increase in looper population levels.

Balsam Woolly Aphid, Adelges picese (Ratz.) - Surveys to delineate new infestations and estimate population levels of the aphid were conducted from St. Andrews to Hawkes Bay and to Sheffield Lake in western Newfoundland. Five trees were tagged at 10 locations and will be sampled annually to monitor population levels in these areas. Population levels have been low in these areas since 1967 but during the past few years, noticeable increases in aphid damage have occurred.

Spruce Beetle, Dendroctonus rufipennis (Kby.) - In 1983 population levels of this beetle have increased and become more widespread. Infestations more than doubled and occurred in small scattered stands of white spruce throughout the Island. Favourable weather during the past years and severe budworm damage to these stands caused endemic conditions.

Black Army Cutworm, Actebia fennica (Tauscher) - High population levels of this pest occurred in a black spruce plantation established on a burned-over area near West Pond, Hall's Bay. Severe defoliation and mortality of tree seedlings were recorded in about 210 ha near West Pond and light to moderate infestation in a 70 ha area near Johnson's Lookout. A chemical control program using Matacil(R) was completed on 16 June but it had little effect on this insect probably because of the lack of foliage in the area at the time of application and the moving of larvae under logs and in the soil. It is recommended that no further planting be conducted in this area until the infestation subsides.

Spruce Bud Midge, Rhabdophaga swainei Felt - Widespread damage of black spruce regenerations by the bud midge occurred on a burned-over area between Gander and Carmanville. The midge bores into buds of spruce trees in late spring and prevents it from developing into a shoot. Normally, infestations develop only in young stands less than 3 m in height. During outbreaks, more than half the buds of a tree may be destroyed including the terminal bud, but damage is seldom permanent as trees fully recover. Branch samples collected from the Taylors Brook area in the Humber River watershed also showed evidence of a similar attack by the bud midge in black and white spruce regeneration.

Spruce Cone Rust, Chrysomyxa pirolata Wint. - New infections of the inland spruce cone rust of black spruce caused by Chrysomyxa pirolata Wint., were recorded in central Newfoundland and on the Avalon Peninsula. The incidence and the intensity of the disease was generally low. Up to 20% of the cones were affected on some trees on the Avalon Peninsula. The disease was found on native white spruce also on the Avalon Peninsula but only 1% of the cones were affected. It is important to monitor this disease because even though the incidence and intensity was low this year, the problem could result in a serious economic loss if a severe outbreak should occur in a seed collection area.

Spruce Budmoth, Zeiraphera canadensis Mut & Free - Population levels of this budmoth were common on mature and immature black spruce throughout central Newfoundland. Light to moderate defoliation to the crowns of trees were most prevalent in the Glovertown - Notre Dame Junction areas. Ornamental white spruce trees in St. John's were also defoliated and from 20% to 80% of the new growth destroyed. Similar damage to spruce trees occurred along the Bauline Line and near Donovans in eastern Newfoundland.

Eastern Blackheaded Budworm, Acleris variana (Fern.) - Population levels of this insect continued to increase in 1983 throughout the

Codroy Valley and near St. Georges and Hughes Book. Light defolaition was detected in several locations but no serious tree damage was recorded.

Yellowhead Spruce Sawfly, Pikonema alaskensis (Roh.) - Small infestations of about 1-2 ha occurred in natural black spruce regeneration near Dawes Pond and in some forest improvement areas on the Bonavista Peninsula. This insect usually attacks small spruce trees in plantations and natural regeneration causing shoot mortality resulting in poor tree form.

Needle Rust of Conifers - Needle rusts of black spruce, Chrysomyxa ledicola Lagerh. and C. empetri Schroet. and balsam fir Pucciniastrum epilobii Otth. were common this past summer. On spruce, a light incidence of the disease was found on a few trees at Birchy Basin and Sops Arm Road and a light to moderate infection was recorded at Junction Brook. On regenerating balsam fir, 30% of the foliage was affected on 20% of the trees on Grand Lake Road, Labrador and light infections were also recorded at Parsons Pond Hill, Goose Arm Road and Wiltondale.

Tip Blight of Balsam Fir, Rehmiellopsis balsameae Waterman - Tip blight of balsam fir was recorded on the Northwest Gander River Road and near the west end of Grand Lake. Damage was recorded on 90% of the shoots of some trees.

Winter Drying - Light to moderate damage was recorded on roadside trees from Daniels Harbour to Bellburns and near Port Saunders on the Northern Peninsula. Light damage was observed on balsam fir near St. John's.

Frost Damage - A late frost which occurred about 13 June caused varying degrees of damage to several species of softwoods and hardwoods throughout central Newfoundland. Regeneration and sapling stages of trees were most affected in the Southwest and Northwest Gander River areas, Gander to Gander Bay and west to Birchy Bay. In the Jumpers Brook area, damage to current growth of balsam fir and several species of hardwoods ranged from 60-100%. Light frost damage also occurred on balsam fir between Lethbridge and Southern Bay in eastern Newfoundland. About 20-50% of the current shoots were destroyed on 25% of the trees in exposed areas along the roadside.

PINE AND LARCH PESTS

Scleroderris Canker, Gremmeniella abietina (Lagerb.) Morelet - In 1983 surveys for the presence of Scleroderris canker included Corner Brook and St. John's and the experimental plantation on the Bauline Line near Torbay. A jack pine plantation at Windsor Lake was also examined. Localities with previous infections of the disease were also monitored. New infection of the European race of Scleroderris canker was recorded on Austrian pine trees at two locations in St. John's.

The incidence of the disease was light. Four trees were infected and had from three to eleven shoots affected. Last year these trees had no signs of infection indicating the disease is spreading in some areas. Other previous infection sites seem to be free of the disease as eradication and pruning of the infected trees appears to be an effective control measure. This disease has not been found beyond the Avalon Peninsula. Monitoring of this disease will continue in 1984.

Eastern Larch Beetle Dendroctonus Simplex Lec. - The larch beetle infestation appears to have subsided in areas infested from about 1977 to 1981. The largest decline has occurred on the Avalon Peninsula where only a few trees were killed in 1983. However, scattered new spot infestations have appeared in 1983 throughout the Island. Concentrations of 1983 brood trees occurred in the Flat Bay, Fischells and Robinson's River watersheds in the west, around Gander in central Newfoundland and Gambo Pond and North Pond in the east. The beetle is killing trees that appear healthy and fully recovered from previous defoliation caused by the spruce budworm and larch sawfly.

Larch Sawfly, Pristiphora erichsonii (Htg.) - Population levels of the sawfly were generally low in the outbreak from Deer Lake to Springdale to Red Indian Lake except for moderate numbers near the Trans Canada Highway about 7 km west of Hampden Junction. High population

levels also resulted in 90% defoliation of tamarack stands near Whitbourne and Mount Pearl.

Larch Shoot Moth, Argyresthia laricella Kearfott - This insect has not been found in the Province since it was collected near Pasadena in 1958. Several specimens were collected in Terra Nova National Park. The larvae mine the shoots of host trees, but damaged tips do not become discolored until the following year. Serious injury, however, is unusual.

White Pine Blister Rust, Cronartium ribicola J.C. Fischer - A high incidence of blister rust infection occurred at Indian River Provincial Park where 70% of all white pine regeneration was infected throughout the Park. Infection was severe on most of the trees with as many as 14 cankers on a dying tree.

Pine Root Collar Weevil, Hylobius warreni Wood - Severe damage and tree mortality were reported in a pine plantation at North Pond. Several trees were found to be dead or dying. This weevil was also found on the roots of trees in all damaged classes in spruce stands in central Newfoundland. In most cases, damage was recorded as light but increased as the different classes increased.

DECIDUOUS TREE PESTS

Birch Casebearer, Coleophora serratella (L.) - Population levels of the casebearer increased this summer throughout the Island. Severe defoliation was reported in western districts from Riverbrook to St. Georges and in provincial parks at Crabbes River, Barachois and Blue Ponds. Moderate damage occurred near Sheffield Lake. Severe defoliation occurred along the trans Canada Highway and secondary roads from Hall's Bay to grand Falls, South Brook to Pelly's Island, along the Port Anson and Gander Bay roads, along Sunday Lake access road and from the Trans Canada Highway to Tote Brook and around Bay d'Espoir. Severe damage was also recoded near Lethbridge and along the Shoal Harbour River in eastern Newfoundland.

Shoot and Leaf Blight of Aspen, Venturia macularis (Fr.) E. Muell & Arx - This disease continued to be common on aspen. In Labrador 20% of the aspen were affected at Northwest River and up to 10% of the foliage on 10% of the trees on the Churchill Road. Up to 60% of the trees were damaged at Crescent Lake in central Newfoundland.

Leaf Rust of Aspen, Melampora abietis-canadensis Ludwig ex Arth - Leaf rust of aspen was unusally conspicuous at the Canadian Forestry Service Nursery at Pasadena where 100% of the trees were affected. Trees were approximately 12 metres in height and 70% of their foliage was affected. The rust was also recorded on a few trees at St. Georges Indian River Provincial Park, Gander, and Terra Nova National Park.

Gypsy Moth and Forest Tent Caterpillar, Lymantria dispar (Linn.) and Malacosoma disstria Hbr. - A survey was conducted in co-operation with Agriculture Canada to monitor any accidental introduction of these pests to the Province in 1983. Pheromone traps were located in camping parks and near major towns. Results showed that no gypsy moths were present in these traps but forest tent caterpillar male moths were common in traps from Stephenville to St. John's.

INSECTS AND DISEASES

Insect or disease	Host(s)	Locality	Remarks
Apiosporina morbosa (Schw.) Arx.des Black knot	Pin cheery Damson, plum Sweet cheery	Throughout Island	Low to high incidence
Chrysomela falsa Brown willow leaf beetle	Willow	Throughout District 112	Low to moderate population levels
Chrysomela mainensis mainensis Bech Alder leaf beetle	Alder	Spruce Brook	High populations
Ciborinia whetzelii (Seav.) Seav. Ink spot	Trembling aspen	Eastern Labrador	Low to moderate incidence
Dioryctria reniculelloides Mut. & Mun. Spruce coneworm	Black spruce White spruce	Throughout Island	Low populations
Fenusa dohrnii (Tischb.) European alder leafminer	Alder	Central Nfld.	Low populations
Fenusa pusilla (Lep.) Birch leafminer	White birch Swamp birch	Throughout Island	Low to moderate population levels and light damage
Isthmiella crepidiformis (Darker) Darker Needle cast	Black spruce	Northern Peninsula	Moderate incidence
Isthmiella faullii (Darker) Darker Needle cast	Balsam fir	Avalon Peninsula, Eastern Labrador	Trace to low incidence
Leucoma salicis (Linn.) Satin moth	Trembling aspen Silver poplar	Western Nfld.	Low populations Light damage

Insect or disease	Host(s)	Locality	Remarks
Lophodermium pinastri (Schrad. ex Hook.) Chev. Needle cast	White pine Scots pine Red pine	Eastern Nfld.	Low to moderate incidence
Midarus abietinus Koc Balsam twig aphid	Balsam fir	Throughout Island	Low to high populations
Neodiprion abietis Complex Balsam fir sawfly	Balsam fir White spruce	Throughout Island	Low populations
Phyllosticta minima (Bark. & Curt.) Underw. & Earle Purple eye spot	Red maple	Western and Central Nfld.	Low to moderate incidence
Phyllocnistis populiella (Chamb.) Aspen leafminer	Trembling aspen Balsam poplar	Western Nfld. Eastern Lab.	Low to high populations
Pollacia elegans Serv. Leaf & shoot blight	Balsam poplar Silver poplar	Western and Central Nfld.	Low to moderate incidence on urban trees
Pucciniastrum epilobii Needle rust	Balsam fir	Western and Central Nfld. Northern Pen. Eastern Labrador	Low incidence
Rehmiellopsis balsameae Waterman Tip blight of balsam fir	Balsam fir	Central Nfld.	High incidence